This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)

2. (Previously Presented) The purge system of claim 5 wherein the threshold voltage is determined by averaging the fuel cell voltage measured across the at least two fuel cells in the fuel cell stack.

3. (Previously Presented) The purge system of claim 5 wherein the threshold voltage is equal to an average fuel cell voltage determined by dividing the voltage across all fuel cells in the fuel cell stack by the total number of fuel cells in the fuel cell stack.

4. (Previously Presented) The purge system of claim 5 wherein the controller determines an average purge cell voltage across a purge cell portion of a fuel cell stack and an average fuel cell voltage across the at least two fuel cells, and the controller is coupled to provide control signals to the actuator to open the purge valve when the average purge cell voltage falls below a defined first percentage of the average fuel cell voltage.

5. (Currently Amended) A purge system for a fuel cell stack, comprising:

a purge valve to regulate flow from the fuel cell stack;

an actuator coupled to open and close the purge valve;

a purge cell voltage sensor coupled across at least one fuel cell forming a purge cell portion of the fuel cell stack to determine the voltage across the purge cell portion;

a fuel cell voltage sensor coupled across at least two fuel cells in the fuel cell stack to determine the voltage across the fuel cells; and

a controller coupled to provide control signals to the actuator to open the purge valve when an average voltage across the purge cell portion of the fuel cell stack falls below a defined first percentage of a threshold voltage measured across the at least two fuel cells wherein

the controller is further coupled to provide control signals to the actuator to close the purge valve after a determined purge duration has elapsed, the determination of purge duration being based on a flow of current through the fuel cell stack measured after a previous closing of the purge valve.

6. (Original) The purge system of claim 4 wherein the controller is further coupled to provide control signals to the actuator to close the purge valve when the average purge cell voltage rises above a defined second percentage of the average fuel cell voltage.

7. (Original) The purge system of claim 6 wherein the defined second percentage is different than the defined first percentage.

8. (Previously Presented) The purge system of claim 6 wherein the defined second percentage is greater than the first percentage.

9. (Previously Presented) The purge system of claim 5 wherein the purge cell portion includes a final two fuel cells which are supplied with a fuel stream which has passed through the remaining fuel cells in the stack.

10. (Original) The purge system of claim 4 wherein the defined first percentage is approximately 90%.

11. (Original) A fuel cell system, comprising:

a fuel cell stack having a plurality of fuel cells;

a purge valve to regulate a purge discharge from the fuel cell stack;

an actuator coupled to open and close the purge valve; and

a controller coupled to control the actuator to open and close the purge valve in a pulsed purge sequence when a fuel cell stack purge condition exists, the pulsed purge sequence comprising:

opening the valve for a purge duration;

closing the purge valve after the purge duration for a hold period;

repeating the opening and closing of the valve at least once; and then

keeping the valve closed for an inter-purge duration before any subsequent purge.

12. (Original) The fuel cell system of claim 11 wherein the controller is configured to determine if a stack purge condition exists by determining if an average purge cell voltage across a purge cell portion of a fuel cell stack exceeds a percentage of an average fuel cell voltage across at least a portion of the fuel cell stack.

13. (Original) The fuel cell system of claim 11 wherein the inter-purge duration is longer than each of the at least one purge duration and hold period in the pulsed purge sequence.

14. (Currently Amended) A fuel cell system, comprising:

a fuel cell stack having a plurality of fuel cells;

a purge valve to regulate a purge discharge from the fuel cell stack;

an actuator coupled to open and close the purge valve; and

a controller coupled to provide control signals to the actuator to open the purge valve when a fuel cell stack purge condition exists and to close the purge valve after a purge duration determined based on a flow of current through the fuel cell stack measured after a previous closing of the purge valve.

15. (Original) The fuel cell system of claim 14 wherein the controller is the configured to determine if a stack purge condition exists by determining if an average purge cell voltage across a purge cell portion of a fuel cell stack exceeds a percentage of an average fuel cell voltage across at least a portion of the fuel cell stack.

16. (Original) A method of operating a fuel cell purge system with a pulsed purge sequence, comprising:

determining that a fuel cell stack purge condition exists;

operating a purge valve in a pulsed purge sequence comprising:

opening the valve for a purge duration;

closing the purge valve after the purge duration for a hold period;

repeating the opening and closing of the valve at least once for a second purge duration; and then

keeping the valve closed for an inter-purge duration before any subsequent purge.

17. (Original) The method of claim 16 wherein the inter-purge duration is longer than each of the at least one purge duration and hold period in the pulsed purge sequence.

18. (Original) The method of claim 16 wherein the first purge duration is the same as the second purge duration.

19. (Original) The method of claim 16 wherein the first purge duration is different than the second purge duration.

20. (Original) The method of claim 16, further comprising:

determining at least one of the first and the second purge durations based on a fuel cell stack current.

21. (Canceled)

22. (Previously Presented) The method of claim 16 wherein determining that a fuel cell stack purge condition exists includes:

determining if an average purge cell voltage across a purge cell portion of a fuel cell stack exceeds a percentage of an average fuel cell voltage across at least a portion of the fuel cell stack.

23-26. (Canceled)

27. (Previously Presented) The method of claim 29 wherein the purge valve is opened if the average purge cell voltage falls below 90 percent of the average fuel cell voltage.

28. (Canceled)

29. (Currently Amended) A method of operating a fuel cell purge system, comprising:

monitoring an average purge cell voltage across a purge cell portion of a fuel cell stack;

monitoring an average fuel cell voltage across at least a portion of the fuel cell stack;

opening a purge valve if the average purge cell voltage falls below a first defined percentage of the average fuel cell voltage;

from time-to-time, determining a current flow through the fuel cell stack;

from time-to-time, determining a purge duration based at least in part on a most recent of the determined current flows~~flow~~; and

closing the purge valve following a most recently determined one of the determined purge durations ~~duration~~ after opening the purge valve.

30. (Previously Presented) The method of claim 29 wherein

determining a purge duration based on the determined current flow comprises determining the purge duration based on a defined linear relationship between current flow and the purge duration.

31. (Previously Presented) The method of claim 29, further comprising:

closing the purge valve when the average purge cell voltage rises above a second defined percentage of the average fuel cell voltage.

32. (Original) The method of claim 31 wherein the second defined percentage is different than the first defined percentage.

33. (Currently Amended) A method of operating a fuel cell purge system, comprising:

from time-to-time during operation, determining a current flow through a fuel cell stack;

from time-to-time during operation, determining a purge duration based at least in part on a most recent of the determined current flows~~flow~~;

opening a purge valve coupled to the fuel cell stack, to discharge a depleted reactant stream from the fuel cell stack; and

closing the purge valve after the purge valve has been open for a most recently determined one of the determined purge durations~~duration~~.

34. (Original) The method of claim 33, further comprising:

monitoring an average purge cell voltage across a purge cell portion of the fuel stack;

monitoring an average fuel cell voltage across at least a portion of the fuel cell stack; and

opening the purge valve if the average purge cell voltage falls below a defined percentage of the average fuel cell voltage.

35. (Canceled)

36. (Previously Presented) A method of operating a fuel cell system, comprising:

opening a purge valve coupled to a purge cell portion of a fuel cell stack to exhaust a purge discharge for a startup purge duration during a starting state at a start of operation of the fuel cell system;

opening the purge valve for a shutdown purge duration during a stopping state at an end of operation of the fuel cell system;

opening the purge valve for a determined purge duration during a purge cycle between the starting state and the stopping state during the operation of the fuel cell system, when a purge condition exists; and

determining the determined purge duration while operating the fuel cell stack based on a flow of current through the fuel cell stack.

37. (Previously Presented) The method of claim 36 wherein a purge condition exists when an average purge cell voltage across a purge cell portion of a fuel cell stack in the system exceeds a percentage of an average fuel cell voltage across at least two fuel cells in the fuel cell stack.

38. (Original) A computer-readable media containing instructions to cause a processor to control operation of a fuel cell system, by:

determining that a fuel cell stack purge condition exists;

operating a purge valve in a pulsed purge sequence comprising:

opening the valve for a purge duration;

closing the purge valve after the purge duration for a hold period;

repeating the opening and closing of the valve at least once; and then

keeping the valve closed for an inter-purge duration before any subsequent purge.

39. (Canceled)

40. (Previously Presented) A computer-readable media containing instructions to cause a processor to control operation of a fuel cell system, by:

monitoring an average purge cell voltage across a purge cell portion of a fuel cell stack;

monitoring an average fuel cell voltage across at least a portion of the fuel cell stack;

opening a purge valve if the average purge cell voltage falls below a first defined percentage of the average fuel cell voltage; and

closing the purge valve when the average purge cell voltage rises above a second defined percentage of the average fuel cell voltage.

41. (Original) A computer-readable media containing instructions to cause a processor to control operation of a fuel cell system, by:

determining a current flow through a fuel cell stack;

determining a purge duration based on the determined current flow;

opening a purge valve coupled to exhaust a purge discharge from the fuel cell stack; and

closing the purge valve at a time equal to the determined purge duration after opening the purge valve.

42. (Canceled)

43. (Previously Presented) A computer-readable media containing instructions to cause a processor to control operation of a fuel cell system, by: opening a purge valve coupled to a purge cell portion of a fuel cell stack to exhaust a purge discharge from the fuel cell stack for a startup purge duration during a starting state at a start of operation of the fuel cell system;

opening the purge valve for a shutdown purge duration during a stopping state at an end of operation of the fuel cell stack;

opening the purge valve for a determined purge duration during a purge cycle between the starting state and the stopping state during the operation of the fuel cell stack, if an average purge cell voltage across the purge cell portion falls below a defined percentage of an average fuel cell voltage across at least a portion of the fuel cell stack; and

determining the determined purge duration based on a flow of current through the fuel cell stack.